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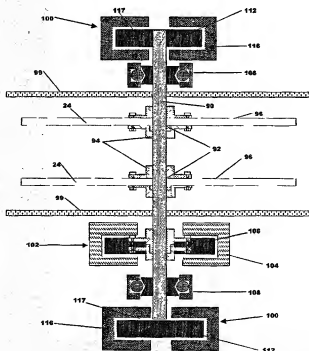
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(54) Title: MASSIVELY PARALLEL FIXED HEAD DISK DRIVE



(57) Abstract: The invention provides an extremely high through-  
put magnetic disk drive which uses massively parallel architecture  
to achieve unprecedented sequential and random access transfer  
rates. The drive consists of a stationary magnetic head assembly  
comprising a single integrated circuit made of silicon along with  
the associated disk and controller. This integrated circuit contains  
heads, amplifiers, buffers and circuits for verification of all disk  
operations. The head assembly operates on disks made of crys-  
talline silicon to avoid problems of differential thermal contraction  
and to insure rigidity. It communicates with the host computer's  
random access memory by means of a novel and unique disk con-  
troller, which has the high capacity throughput to take advantage  
of the high throughput speed of this disk drive. The most impor-  
tant feature of this disk drive is that all disk tracks are processed  
(read or written) concurrently each time a given sector is available  
to the heads, which means that the entire disk can be read or  
written on each revolution. Massively parallel architecture throughout the  
head and controller design permits the achievement of typical se-  
quential input/output transfer rates of more than 60 Gigabytes per  
second, having average sequential access times of 0.011 microsec-  
onds (roughly 2000 times as fast as current technology) and aver-  
age random access times on the order of 10 microseconds (roughly  
5000 times as fast as current technology). This will provide large  
multi-user computer systems with an overall increase of through-  
put of a factor of at least 2000.

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